

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A high performance SiGe HBT that has comprising a SiGe layer with a peak Ge concentration of at least approximately 20% and a boron-doped base region formed therein having a thickness, wherein said base region includes diffusion-limiting impurities throughout said thickness at a concentration below that of boron in said base region, wherein said SiGe layer has a thickness that is substantially greater than a peak concentration thickness of the Ge and wherein said diffusion limiting impurities are physically located relative to both said base region and a portion of said SiGe layer having a and wherein said peak Ge concentration of is at least approximately 20% to optimize performance and yield of said SiGe HBT.

2. (Cancelled)

3. (Withdrawn)

4. (Cancelled)

5. (Currently Amended) The device of claim 1, A high performance SiGe HBT comprising a SiGe layer with a peak Ge concentration and a boron-doped base region having a thickness, wherein said base region includes diffusion limiting impurities throughout said

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thickness at a concentration below that of boron in said base region, wherein said diffusion limiting impurities are physically located relative to both said base region and a portion of said SiGe layer, and wherein said peak Ge concentration is at least approximately 20% to optimize performance and yield of said SiGe HBT and wherein said SiGe layer has a thickness of approximately 300-900 Å, and wherein the Ge has a peak concentration thickness of approximately 20-100 Å.

6. (Currently Amended) The device of claim 5, wherein said base region is approximately 10-150 angstroms Å in thickness.

7. (Original) The device of claim 6, wherein the base region has a peak boron concentration of boron of approximately  $8.5 \times 10^{19} / \text{cm}^3$ .

8. (Original) The device of claim 1, wherein said diffusion limiting impurity comprises carbon.

9. (Original) The device of claim 8, wherein said carbon has a peak concentration between approximately  $1 \times 10^{19} / \text{cm}^3$  and  $4 \times 10^{19} / \text{cm}^3$ .

10. (Currently Amended) The device of claim 8, wherein said carbon defines a dopant region that is approximately 10 - 500 angstroms  $\text{\AA}$  in thickness.

11. (Currently Amended) The device of claim 8, A high performance SiGe HBT comprising a SiGe layer with a peak Ge concentration and a boron-doped base region having a thickness, wherein said base region includes diffusion limiting impurities throughout said thickness at a concentration below that of boron in said base region, wherein said diffusion limiting impurities are physically located relative to both said base region and a portion of said SiGe layer, and wherein said peak Ge concentration is at least approximately 20% to optimize performance and yield of said SiGe HBT and wherein said carbon has diffusion limiting impurity defines a dopant region having an upper bound and a lower bound, wherein said peak concentration thickness of said Ge has an upper bound and a lower bound, and wherein said lower bound of said carbon diffusion limiting impurity region is within approximately 150 angstroms  $\text{\AA}$  of said upper bound of said peak concentration thickness of said Ge.

12. (Currently Amended) The device of claim ~~11~~11, wherein said base region is within approximately 200 - 250 angstroms  $\text{\AA}$  of said upper bound of said peak concentration thickness of said Ge.

13. (Withdrawn)

14. (Withdrawn)

15. (Withdrawn)

16. (Withdrawn)

17. (Cancelled)

18. (Currently Amended) The device of claim 16, A SiGe HBT comprising an a SiGe layer, a base region, and a diffusion-limiting region, in which said diffusion-limiting region extends substantially throughout said base region and has a dopant concentration less than that of said base region, and wherein both said base region and said diffusion-limiting region are spaced within a given distance of a portion of said SiGe layer having a peak Ge concentration of at least approximately 20% so as to optimize both performance and yield of said SiGe HBT, and wherein said base region is within approximately 250 Å of said portion of said SiGe layer having a peak Ge concentration.

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19. (Currently Amended) The device of claim ~~17~~ 18, wherein said diffusion-limiting region is within approximately 150 Å of said portion of said SiGe layer having a peak Ge concentration.

20. (Cancelled)

21. (New) The device of claim 11, wherein said diffusion limiting impurity comprises carbon.